

### **REMARKS**

Claims 1-23 are pending in the case. The Office Action rejected each of claims 1-23 on various grounds. More particularly, the Office Action rejected:

- claims 1-6, 8-11, 15-18, and 20-23 as obvious under 35 U.S.C. § 103(a) by Yan Yan & R. James Brown, “Suppression of Water-Column Multiples by Combining Components of OBS Surveys”, 13 CREWES Research Report 321 (2001) (“Yan (2001)”) in combination with U.S. Letters Patent 5,696,734 (“Corrigan”);
- claims 1-6, 8, 10-11, 15-18, and 20-23 as obvious under 35 U.S.C. § 103(a) over Yan Yan & R. James Brown, “Suppression of Multiples by Wavefield Separation Techniques”, 12 CREWES Research Report 1 (2000) (“Yan (2000)”) in combination with Corrigan;
- claim 7 as obvious under 35 U.S.C. § 103(a) over Yan (2001) in view of Corrigan;
- claims 12-14 and 19 as obvious under 35 U.S.C. § 103(a) over Yan (2001) or Yan (2000) in combination with Corrigan and U.S. Letters Patent 6,314,371 (“Monk”)<sup>1</sup>; and

Applicants traverse each of the rejections.

### **CLAIMS 1-11, 15-18, AND 20-23 ARE ALLOWABLE OVER YAN (2001) AND CORRIGAN**

The Office rejected claims 1-11, 15-18, and 20-23 as obvious under 35 U.S.C. § 103(a) by Yan Yan & R. James Brown, “Suppression of Water-Column Multiples by Combining Components of OBS Surveys”, 13 CREWES Research Report 321 (2001) (“Yan (2001)”) in combination with U.S. Letters Patent 5,696,734 (“Corrigan”). This rejection fails because (1) Yan (2001) is not prior art and (2) Yan (2001) fails to teach all the limitations for which it is cited.

#### **Yan (2001) is Not Prior Art**

Applicants maintain, and have consistently maintained throughout this prosecution, that Yan (2001) is not prior art. It is the Office's burden to establish *prima facie* that the claimed

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<sup>1</sup> Monk is not prior art to Applicant's invention. Applicant's priority date is January 11, 2002. Monk was patented in November 2001. Monk is therefore only citable under the legal fiction employed by the Office that it *prima facie*

invention is obvious. This includes the burden of showing that the references are within the scope and content of the prior art. *In re Oetiker*, 24 U.S.P.Q.2d (BNA) 1443, 1445-46 (Fed. Cir. 1992).

Applicants' priority date is January 11, 2002, meaning that Yan (2001) is prior art only if published or became well known in the period January 1-10, 2001. The Office has failed to prove *any* month or day of publication. The Office does not dispute this fact and failed to even address it in the last Office Action. Accordingly, the Office has failed to prove that Yan (2001) is within the scope and content of the prior art and, therefore, that Yan (2001) in any combination of art renders obvious any claim.

### **The Cited Art Fails to Teach All the Limitations of the Claims**

To establish a *prima facie* case of obviousness, the prior art reference (or references when combined) must teach or suggest all the claim limitations. M.P.E.P. § 706.02(j); *In re Royka*, 490 F.2d 981, 180 U.S.P.Q. 580 (CCPA 1974). Applicants maintain that Yan (2001) does not teach all the limitations for which it is cited and that, therefore, the cited art as a whole does not teach all the limitations of the claims.

Nowhere does Yan (2001) detect direct arrival from a down-going component of the wavefield. As previously pointed out, Yan (2001) teaches that the direct arrival comprises a portion of the down-going wavefield as is shown in Figure 23. From this fact, and from the teaching that up- and down-going wavefields, the Office extrapolates that Yan (2001) teaches "using the downgoing component of the parameter to identify the direct arrival". But, if separating the up- and down-going wavefields yields all the down-going components shown in Figure 23, why would one need to then redundantly detect the direct arrival from a downgoing component? They would not, as it would already have been determined.

The Office maintains, though, that merely teaching direct arrival as a part of the downgoing wavefield means the claim limitations "...since the 'parameter' of the claims is a broad limitation that can be anything related to the acquired wavefields." This observation on the breadth of the language ignores the fact that the claims language require that the parameter be used "to identify the direct arrival", which Yan (2001) fails to teach.

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evidences activities by others prior to Applicant's invention, assuming that Applicant's filing date is the date of invention. Applicant reserves the right to swear behind Monk at a later date should he wish to do so.

The Office also maintains that “Yan shows identifying the direct arrival (from breaks) after processing the acoustic data to obtain information about a parameter of the acoustic log (pressure related to time acquired by receivers) in Figs. 14-17.” However, a closer inspection of Yan 2001 shows this to be a misconstruction. The section of Yan 2001 discussing these figures reads in total:

### **Polarity determination**

Before processing, we should decide whether the datasets have normal or reverse polarity. How do we ensure this? Brown (1999) gives detailed guidelines. According to him, to ensure positive or normal polarity for the vertical (Z) component, the direct downgoing P should have positive onsets. For normal polarity on the hydrophone (W) component, the direct P should then have negative onsets. For normal polarity on the inline (X) component, the direct P should have positive onsets. This normally means flipping X polarity for negative offsets. The crossline component should be treated in basically the same way as the inline component (Brown, 1999).

Figure 14 shows the vertical-component common-receiver gather. The first breaks, due to direct downgoing P, are seen at zero-offset at about 65ms. This arrival has a positive break. For the hydrophone-component common-receiver gather shown in Figure 15, the direct P should then have negative break. Figure 16 shows the inline component common-receiver gather. We can see that positive-offset traces and negative-offset traces have the opposite polarity. After flipping polarity for negative offsets, we can see that the direct P wave now has a positive break for all offsets (Figure 17).

From Figure (14), (15) and (17), we can see this is very noisy dataset. The watercolumn reverberation arriving after the direct arrival, and those multiples associated with primary reflections, contaminate the whole section. Primary events are difficult to identify on both hydrophone data and geophone data.

(Yan 2001, pp. 337-338) Thus, Yan 2001 uses the direct arrival as a reference in a visual inspection to teach the relationship between noise and polarity determination. This is a very different thing from what it is cited for teaching.

### **Conclusion on this Rejection**

Thus, Applicants respectfully submit that these rejections are improvident. First, the Office has failed to prove that Yan 2001 is within the scope and content of the prior art, which is a part of its burden of proof. *In re Oetiker*, 24 U.S.P.Q.2d (BNA) 1443, 1445-46 (Fed. Cir. 1992). Second, Yan 2001 fails to teach all the limitations for which it is cited and that, therefore, the cited art as a whole does not teach all the limitations of the claims. M.P.E.P. § 706.02(j); *In re Royka*, 490 F.2d 981, 180 U.S.P.Q. 580 (CCPA 1974).

**CLAIMS 1-6, 8, 10-11, 15-18, AND 20-23 ARE ALLOWABLE  
OVER YAN (2000) AND CORRIGAN**

The Office rejected claims 1-6, 8, 10-11, 15-18, and 20-23 as obvious under 35 U.S.C. § 103(a) over Yan Yan & R. James Brown, "Suppression of Multiples by Wavefield Separation Techniques", 12 CREWES Research Report 1 (2000) ("Yan (2000)") in combination with U.S. Letters Patent 5,696,734 ("Corrigan").

As Applicants have consistently maintained, Yan (2000) does not teach all the limitations for which it is cited. Yan (2000) teaches no more than that direct arrivals comprise a portion of the downgoing wavefields and that direct arrivals can be visually detected in graphical representations of synthetic data. The Office's position that these passages actually teach detecting the direct arrival of a downgoing wavefield from a parameter of the wavefield in a computer implemented method clearly result from hindsight from the teachings of Applicants' disclosure.

Thus, Yan 2000 fails to teach all the limitations for which it is cited and that, therefore, the cited art as a whole does not teach all the limitations of the claims. To establish obviousness *prima facie*, the cited art must disclose all the limitations of the claims. M.P.E.P. § 706.02(j); *In re Royka*, 490 F.2d 981, 180 U.S.P.Q. 580 (CCPA 1974). Accordingly, these rejections fail as well.

**CLAIMS 12-14 AND 19 ARE ALLOWABLE OVER  
YAN (2001) OR YAN (2000) AND CORRIGAN AND MONK**

The Office rejected claims 12-14 and 19 as obvious under 35 U.S.C. § 103(a) over Yan (2001) or Yan (2000) in combination with U.S. Letters Patent 5,696,734 ("Corrigan") and U.S.

Letters Patent 6,314,371 ("Monk"). This rejection relies on both Yan (2000) and Yan (2001) in the alternative. It therefore suffers from the same flaws established above. Applicants therefore incorporate their references set forth above with respect to Yan (2000) and Yan (2001) in response to this rejection, as well.

#### **CONCLUDING REMARKS**

Applicants therefore respectfully submit that the claims are in condition for allowance, and requests that the rejections be withdrawn and the claims be allowed to issue. The Examiner is invited to contact the undersigned attorney at (713) 934-4053 with any questions, comments or suggestions relating to the referenced patent application.

Respectfully submitted,

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